Gas chromatographs

HP-5890 A, 5890 Series II and UniChrom

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Instrument peculiarities

The are different models of instrument: HP-5890, HP-5890A, HP-5890 Series II. Each model has differences in main boards and in communication boards which either have different communication protocols.

A the moment of writing present manual the UniChrom is supporting two different communication protocols for HP-5890 instrument series, each protocol is provided by corresponding communication boards:

- HPIB/RS-232C communications (DICE board) - **HP part 19257-60010**
- RS-232C communications - **HP part 19242-60030**

The first communication option (19257) generally shipped with HP instruments intended for HP Chemstation Data System control. This board supports either HPIB as RS-232 communications. HPIB address and RS-232 baud rate is set using switches block on board. Both data paths (HPIB and RS) use the same communication protocol. GC equipped with such board can be connected to UniChrom PC either with RS-232 or GPIB/HPIB bus.

The second communication option (19242) was generally intended for non-HP CDS. The board use different from 19257 communication protocol and is configured from GC keyboard.

Setting the communication parameters of 19242-xxxxx board

Setting the port rate, HRRQ, and STRQ

The following procedure configures serial port speed to 19200 bps.

Keyboard actions	HP 5890A instrument displays
Turn ON GC	**EMULATION MODE OK**
Clear	Any messages
.	**CALIB AND TEST [0-9]**
3	**CONFIGURE NETWORK**
Enter	**GLOBAL addr: ##,##** or **Local addr: ##,##**
0	**DEFAULT ADDRESS * 0**
Enter	**GLOBAL addr: ##, 0** or **Local addr: ##, 0**

Clear	Any messages
.	**CALIB AND TEST [0-9]**
5	**SELF TEST**
Enter	GC will reboot with new configuration

RS232 cable wiring

The communication board has 12-pin J13 header intended for connection RS-232 cable to PC. The header is located at the top-most edge of the board and have to be visible in the top cover opening whilst the board is installed.

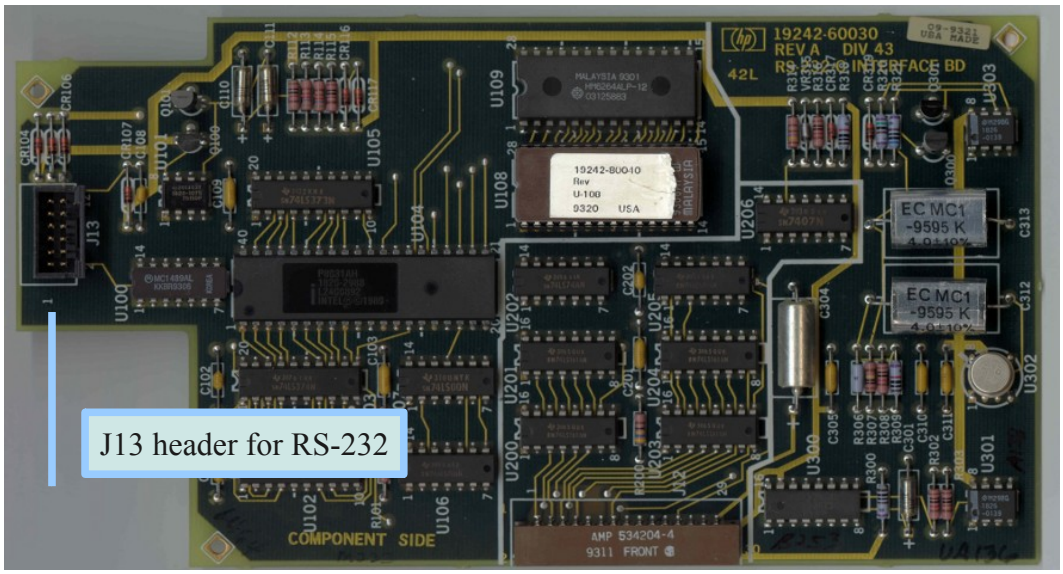


Fig. 1: 19242-xxxxx communication board connectors

Please note, the 1st pin of J13 location and pin numbering.

J13.1 GND
J13.2 RXD (RECEIVE DATA)
J13.3 TXD (TRANSMIT DATA)
J13.4 GND
J13.5 GND
J13.6 GND
J13.7 GND
J13.8 GND
J13.9 GND
J13.10 TXD (TRANSMIT DATA)
J13.11 RXD (RECEIVE DATA)
J13.12 GND

Pin J13.1 is at the top left when the board is mounted in-place. Upper row is odd-numbered pins left to right, lower – even-numbered pins left to right.

25-pin cable (Agilent part 19242-60500)

25 Pin Connector	Color	Function	12-Pin Connector J13
1	Silver	Ground	4 (also connect to shield)
2	Blue	Transmit	5
3	Red	Receive	1
7	Green	Ground	3

Stock Agilent cable is ended with 25M connector.

The instrument can be connected using standard modem cable (straight-through DTE-DCE) and attached a null modem/gender changer.

Or, the cable with the following pin-out:

DB9 Female (to PC)	DB 25 Female (to Agilent cable)
2	2
3	3
5	7

Configuring HP 5890 SERIES II GC Dice board (19257-xxxxx)

RS-232 configuration

Generally the RS-232 port speed have to be set at maximal rate 19200 bps. When the port rate is unknown or the rate have to be changed, the following steps are performed:

1. Turn the GC on and hold the **[Clear]** button during the boot. (When GC was ON – perform restart by pressing **[Clear]**, **[.]**, **[5]**, and the **[Enter]**. After reboot hold the **[Clear]** button pressed)
2. When the GC displays : **User Tests Sel 0..7**, press **[4]**. At the instrument display would be shown current GC serial port speed, for instance
   RS232 Baud = 19.2K.
   When the GC display shows HPIB configuration
   HP-IB = nn , then the switches of 19257-xxxxx have to be changed to RS232 communication mode.
3. When needed – alter the switches on the DICE board. See Fig.1. for settings required for 19200 bps port rate. As soon you modify switches position GC will show on display the selected RS-232 port rate.
   Carefully study HP 5890 SERIES II Gas Chromatograph Service Manual about accessing, installation and removal procedure for communication board.

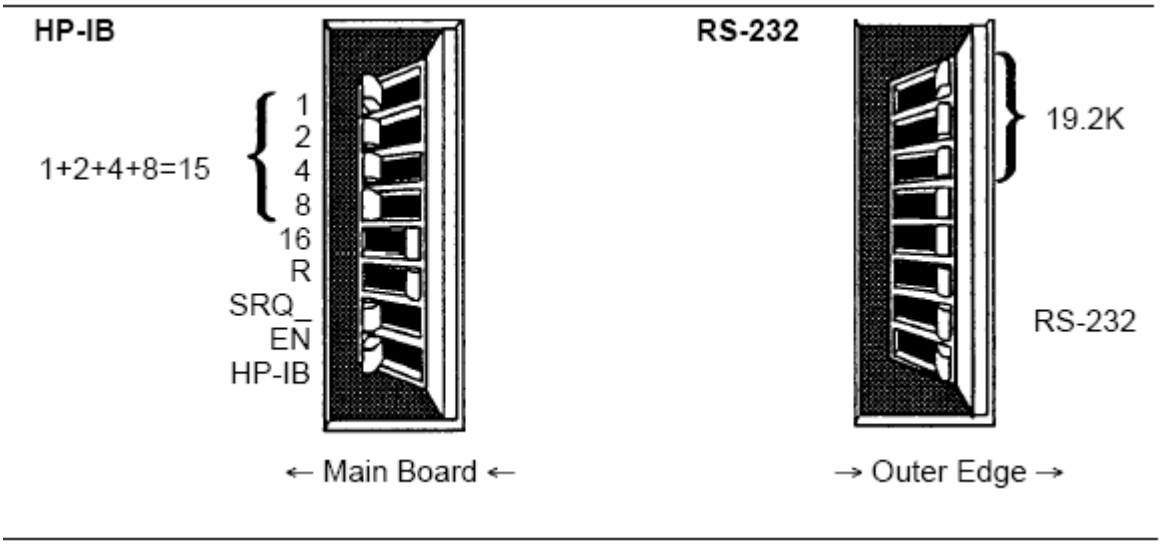


Fig.1. Setting HP 5890 DICE board at 19200 bps

Toggle 1	OFF	ON	OFF	ON	OFF	ON	OFF	ON
Toggle 2	OFF	OFF	ON	ON	OFF	OFF	ON	ON
Toggle 3	OFF	OFF	OFF	OFF	ON	ON	ON	ON
Baud Rate	150	300	600	1.2K	2.4K	4.8K	9.6K	19.2K

Fig. 2. Switches for RS-232 baud rate selection

4. Write down the changes you made in work journal.
5. Restore GC to normal functionality

   For this press at GC keyboard **[7]**, **[Enter]** for GC reboot.

RS-232 cable wiring

RS-232 cable for HP-5890 with 19257-60010		
25-pin male (GC)	**25-pin female (PC)**	**9-pin female (PC)**
7 - Signal ground	7 - Signal ground	5 - Signal ground
2 - TD	3 - RD	2 - RD
3 - RD	2 - TD	3 - TD

HPIB configuration

For configuring the board 19257-xxxxx into HPIB it is required both lower at Fig.1 switches set to OFF position. At the switches (1-16) is defined HPIB address (in binary system, 1,2,4,8 is a corresponding decimal numbers which are summed to form decimal address representation). Standard address 15 is defined by setting into ON positions all of the 1-8 switches, and setting switch 16 to off.

On the PC have to be installed then HPIOLIBS (Agilent IO Libaries) communication layer package. HPIOLIBS package can be downloaded from Agilent test and measurement equipment web-site. http://www.google.com/search?q=hpiolibs.exe

During the HPIOLIBS configuration the name for GPIB host-controller is defined for SICL and VISA (e.g. gpib0 or hp82350). UniChrom utilizes only SICL and treats the communication port as GPIB bus only if the host-controller name starts with gp or hp strictly.

For UniChrom the communication resource of type GPIB is specified by the name starting from **gp** or **hp** and instrument ID delimited with comma. For instance **gpib0,15**

Firmware version compatibility for method set-points transfer

Gas chromatograph can be configured in the following firmware modes:

- **HP 5890A Mode**
- **HP 5890 SERIES II Mode.**

Instrument firmware modes and analytical software protocol handler have to correspond each other.

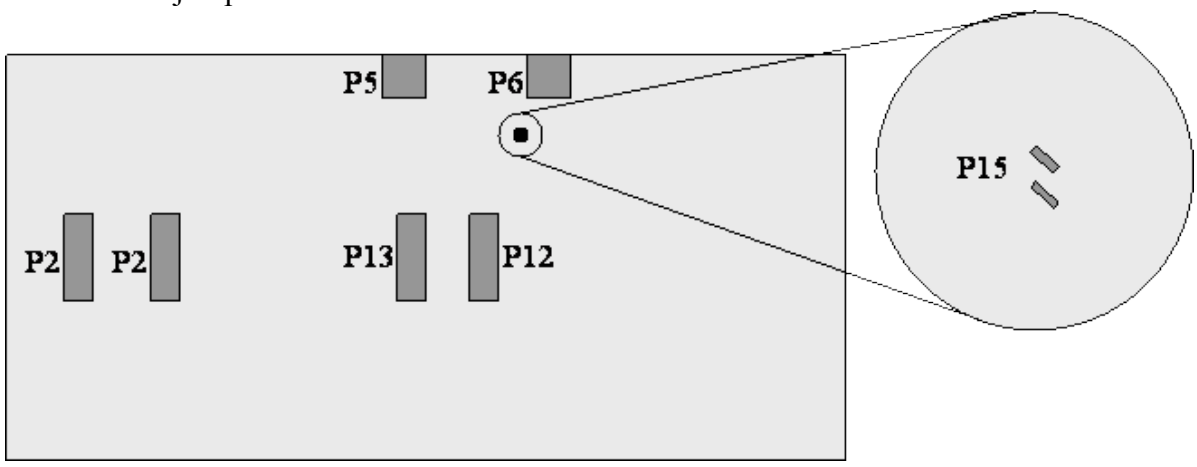
Determining the instrument firmware mode

1. Turn OFF the GC and the after several seconds ON again.
2. Check the text GC displays after boot

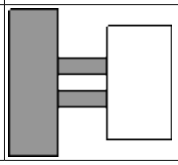
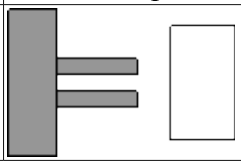
Instrument firmware mode	HP 5890A Mode	HP 5890 SERIES II Mode
GC shows after power-ON	EMULATION MODE OK	PASSED SELF TEST

Changing firmware protocol mode

1. Turn the GC OFF
2. Remove the right side panel of GC and examine the main board.
3. To avoid electrostatic damage of main board, ground yourself to GC chassis with the antistatic bracelet or touch the unpainted part of the instrument (for instance oven door latch).
4. Find the P15 jumper at the GC main board.



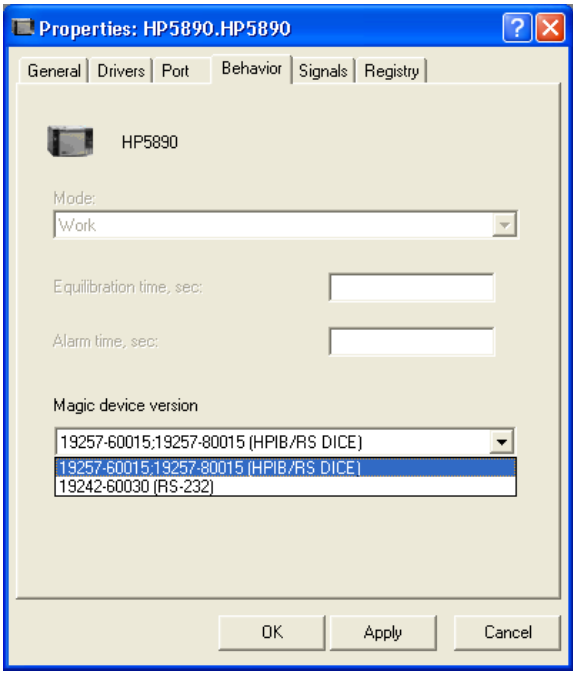
5. Set the jumper cap (Part No. 1258-0141 or similar) for selecting GC firmware mode.

GC firmware mode	**HP 5890A Mode**	**HP 5890 SERIES II Mode**
Jumper state	Jumper is set	Jumper is removed
		

6. Install the side panel in place and turn the instrument ON.

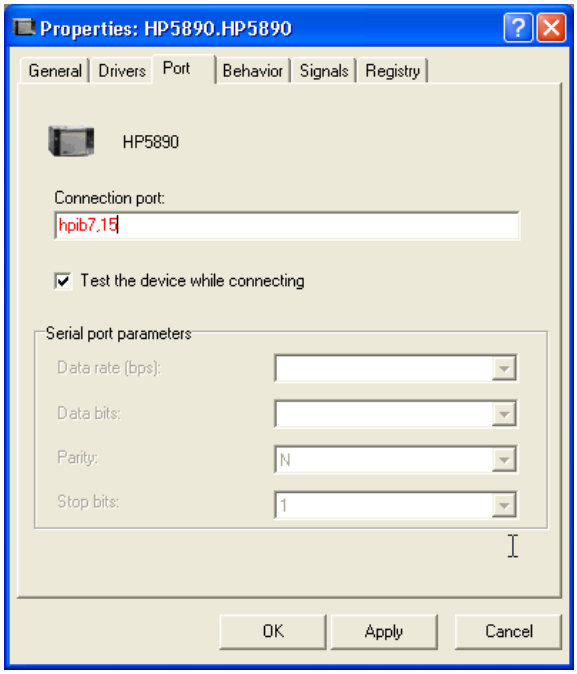
UniChrom specials

Both communication options (19257-, 19242-) are supported in UniChrom **by single driver** HP-5890. The page "Behavior" in "Configuration Editor" is intended for specification of communication board type.



Specifying communication board type

- HPIB/RS-232C communications - **HP part 19257-60010**
- RS-232C communications - **HP part 19242-60030**



Specifying communication port name

Instrument driver is developed as networked chromatograph and supports the following types of communication port specification (in UniChrom style):

1. **tcp:hostname:portnumber**
2. **hpib7,15** ... **gpib0,15** (HPIOLIBS style)
3. **COM1** ... **COM256**

Absence of communication port name means automatic instrument detection over all installed serial ports.

Autosampler 7673

UniChrom supports autosampler HP7673, connected to HPIL (INET) bus. When during instrument detection (connection to instrument) in the loop (HP-IL) would be sampler detected, then sampler parameters can be modified from UniChrom method at page «GC Instrument», and sample sequence is specified at page «Samples».